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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/014,418	12/14/2001	Katsumi Nakagawa	35.C16024	9769
5514	7590	11/10/2004		
FITZPATRICK CELLA HARPER & SCINTO 30 ROCKEFELLER PLAZA NEW YORK, NY 10112			EXAMINER SONG, MATTHEW J	
			ART UNIT	PAPER NUMBER
			1765	
DATE MAILED: 11/10/2004				

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/014,418

Applicant(s)

NAKAGAWA ET AL.

Examiner

Matthew J Song

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 02 September 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 4,9,30 and 35 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 4,9,30 and 35 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 8/3/2004 has been entered.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 9 and 35 rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 9 recites, " a straight line grown from a center of a surface of each respective substrate in the group of substrates to the axis of the center of rotation of the crucible falls at a right angle with the surface and falls at a right angle with the axis of the center of rotation of the crucible" in the last full paragraph. There is no support for this limitation in the instant specification. It is unclear from Fig 12 if the wafers are being held at a right angles, as claimed. And the instant

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specification merely teaches the wafers are held upright (pg 24), which does not provide support for the specific relationship between the wafers and the axis of rotation, as claimed.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

5. Claims 9 and 35 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 9 recites, “ a straight line grown from a center of a surface of each respective substrate in the group of substrates to the axis of the center of rotation of the crucible falls at a right angle with the surface and falls at a right angle with the axis of the center of rotation of the crucible” in the last full paragraph. It is unclear where this line originates from in the substrate. A substrate has many surfaces, such as a top surface, a bottom surface, a peripheral surface. As claimed, it is unclear which surface of the substrate is required to have the claimed right angle relationship.

#### ***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 9 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over O'Neill (US 4,243,472) in view of Dauncey (US 2,759,803).

O'Neill discloses a method for liquid phase epitaxy of multiple wafers, note entire reference, comprising a crucible 14 filled with a melt material 16 to be epitaxially deposited on substrates (col 2, ln 15-35). O'Neill also discloses a substrate holder 10 and supporting a plurality of wafers 12 substantially horizontal and lowering and immersing the wafers into a melt to deposit a thin film on each wafer (col 1, ln 60-68) using a dipping rod member 18 connected at one end to a means for raising and lowering the substrate into the crucible (col 2, ln 36-67). O'Neill also discloses the substrate is disposed at a position set aside from the center of the crucible (Figs 2-4). O'Neill also discloses continually oscillating 30 the wafers through substantially 360°C (col 2, ln 1-2, col 4, ln 10-20 and Figs 2-4); this reads on applicant's rotation of the supporting rack during crystal growth. O'Neill et al also teaches any apparatus capable of supporting and dipping a plurality of substrate in a melt filled crucible may be used so long as

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the apparatus is capable of raising, lowering and oscillating the substrate while in the flux (col 2, ln 29-34).

O'Neill does not disclose no part of the substrate is disposed at the center of rotation of the supporting rack. However, O'Neill is open to using other support apparatuses.

In an apparatus for growing crystals, note entire reference, Dauncey teaches a support **1** used for mounting crystals in a crystal growing tank. The support comprises a shaft **2** to which circular horizontal shelves are secured by struts projection from collars on the shaft. The support may be rotated about the longitudinal axis of the shaft and no part of the substrates are disposed at the center of rotation of the supporting rack (Figs 1-2 and col 2, ln 45 to col 3, ln 25). Dauncey also teaches a winch **19** for withdrawing the support and lowering the support (col 3, ln 25 to col 4, ln 20).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Neill with Dauncey's support rack because a larger number of substrates can be supported, which increasing productivity.

The combination of O'Neill and Dauncey is silent substrate are arranged such that a straight line drawn from a center of a surface of each respective substrate in the group of substrates to the axis of the center of rotation of the crucible falls at a right angle with the surface and falls at a right angle with the axis of the center of rotation. The combination of O'Neill and Dauncey does teach substrates, which are arranged about the center of rotation of the crucible and lay flat and perpendicular to the axis of rotation (Fig 1). Each substrate has a thickness and the periphery of each wafer about the wafer's thickness reads on applicants' surface. A line

drawn from the center of the outer periphery of the thickness of the wafer would fall at a right angle with axis of the center of rotation and the surface of the periphery.

8. Claims 4 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over O'Neill (US 4,243,472) in view of Dauncey (US 2,759,803), as applied to claims 9 and 35 above, and further in view of Sasaki et al (WO 00/71786), where EP 1201793 is used as an accurate translation.

The combination of O'Neill and Dauncey teaches all of the limitations of claim 9, as discussed previously, except, the combination of O'Neill and Dauncey does not teach a flow adjusting means is provided stationarily in the melt to make the flow of the melt toward the center of rotation and/or the liquid surface of the melt.

In a method of growing a crystal from a melt, Sakaki et al teaches a seed crystal is brought into contact with a melt held in a crucible to grow a single crystal ('793 [0013]). Sakaki et al also teaches the crystal is grown with rotating the crucible without rotating a blade or baffle member ('793 [0008]). Sakaki et al also teaches the presence of the blade member or baffle member and the rotation of the crucible enhance the effect of stirring of the melt, which enables the growth of high quality single crystals ('793 [0017]). Sakaki et al teaches the blade member can have various shapes and a screw form is exemplified ('793 [0018]; Fig 1 and Fig 3), this reads on applicants' flow adjusting means inclined toward the center of rotation and/or the liquid surface of the melt.

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the combination of O'Neill and Dauncey with Sasaki's stationary blade

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member in a rotating crucible to enhance the effect of stirring the raw material melt, which is desirable.

### ***Response to Arguments***

9. Applicant's arguments, see page 7 of the remarks, filed 8/3/2004, with respect to the rejection over JP '280 have been fully considered and are persuasive. The rejection of claims 4 and 30 has been withdrawn.

10. Applicant's arguments with respect to claims 4, 9, 30, and 35 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

O'Neill (US 4,191,365) teaches a horizontal substrate holder for liquid phase epitaxy, note entire reference.

Iwane et al (US 2002/0108559) is a publication of application 10/022,545 to applicant, which teaches similar features as claimed, note entire reference.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew J Song whose telephone number is 571-272-1468. The examiner can normally be reached on M-F 9:00-5:00.




If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 571-272-1465. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Matthew J Song  
Examiner  
Art Unit 1765

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